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An Interpretation of Agricultural Land use Across the Shelbyville Moraine

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AN INTERPRETATION OF AGRICULTURAL LAND USE ACROSS THE SHELBYVILLE MORAINE

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Troyt York

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July 29, 1963 Troyt B. York

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PREFACE

In making agricultural field investigations the best evidence comes from informants who are engaged in the agricultural enterprise. The methods employed in this study are the same as those used by other geographers. They consist primarily of careful field observations, interviews with informants from representative areas, taking of careful field notes and photographs, and using questionnaire results for the construction of maps for descriptive, comparative analysis. The major objective of this investigation has been to understand the present agricultural land use of Coles and Cumberland county as an expression of the use of a physically diverse area.

In view of this objective a questionnaire was designed and distributed at random among a sample of the rural occupants of each township in Coles and Cumberland county. These informants were not all authorities on the agriculture of the total area. Indeed, many were hired men or tenants who had little notion of the overall agricultural operation, but all were involved in the enterprise and intimately aware of their own activities. All were familiar with what they had and what they were doing within the framework of their own farms. The questionnaire was designed in such a manner that responses, when they

were forthcoming, were of a quantitative nature, (See Appendix A) thus easily adaptable to cartographic and statistical interpollation and presentation where such analysis was fitting. In addition to the questionnaire, which was the primary source of detailed information at the farm level, there were the accessors reports of the Illinois Cooperative Crop Reporting Service. This valuable source of statistical information provided data concerning each of the various crops and types of livestock grown in both counties. The data was organized by township thus providing an adequate base from which the basic maps appearing in the study were constructed.

Finally, the author has organized and carried out a rather complete program of field work in which the many photographs appearing in the paper were taken, carefully integrated with field notes, and substantiated by many unstructured conversations with farmers and business men who have had long experience in the study area. Included among these men were the farm advisors of both counties. The ground photographs of specific subjects in specified areas have been strengthened greatly by several thorough aerial reconnaissance flights made at different altitudes and different periods during the early growing season. Aerial oblique photographs of type areas have provided valuable generalized impressions of the topographic and agricultural structure of the entire area. It is upon

these observations and measurements that the following analysis is based.

CHAPTER I

The kind of farming that prevails in a region is the product of many complex and interrelated factors, soils and topography, climate, markets, and people. It is important that these relationships be recognized and established if the true character of the agricultural enterprise is to be understood.

Often such relationships are so subtle and unobservable that only by the most sophisticated cartographic and statistical measurements may similarities and differences from one area to another be recognized. In many cases careful analysis of these cartographic and statistical presentations reveals certain relationships which were not previously recognized or understood fully.

Various writers on the subject of midwestern agriculture have stated that the Shelbyville moraine marks not only the terminous of the Wisconsin glacial epoch but also the southern boundary of the renouned Cash-Grain area.[1] Coles and Cumberland county, the area chosen for this study, if considered as a sample of territory rather than two political divisions represents almost equally type areas of both the Cash-Grain Farming region

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[1]John H. Garland, The North American Midwest, (New York: John Wiley & Sons, Inc., 1955), p. 96.

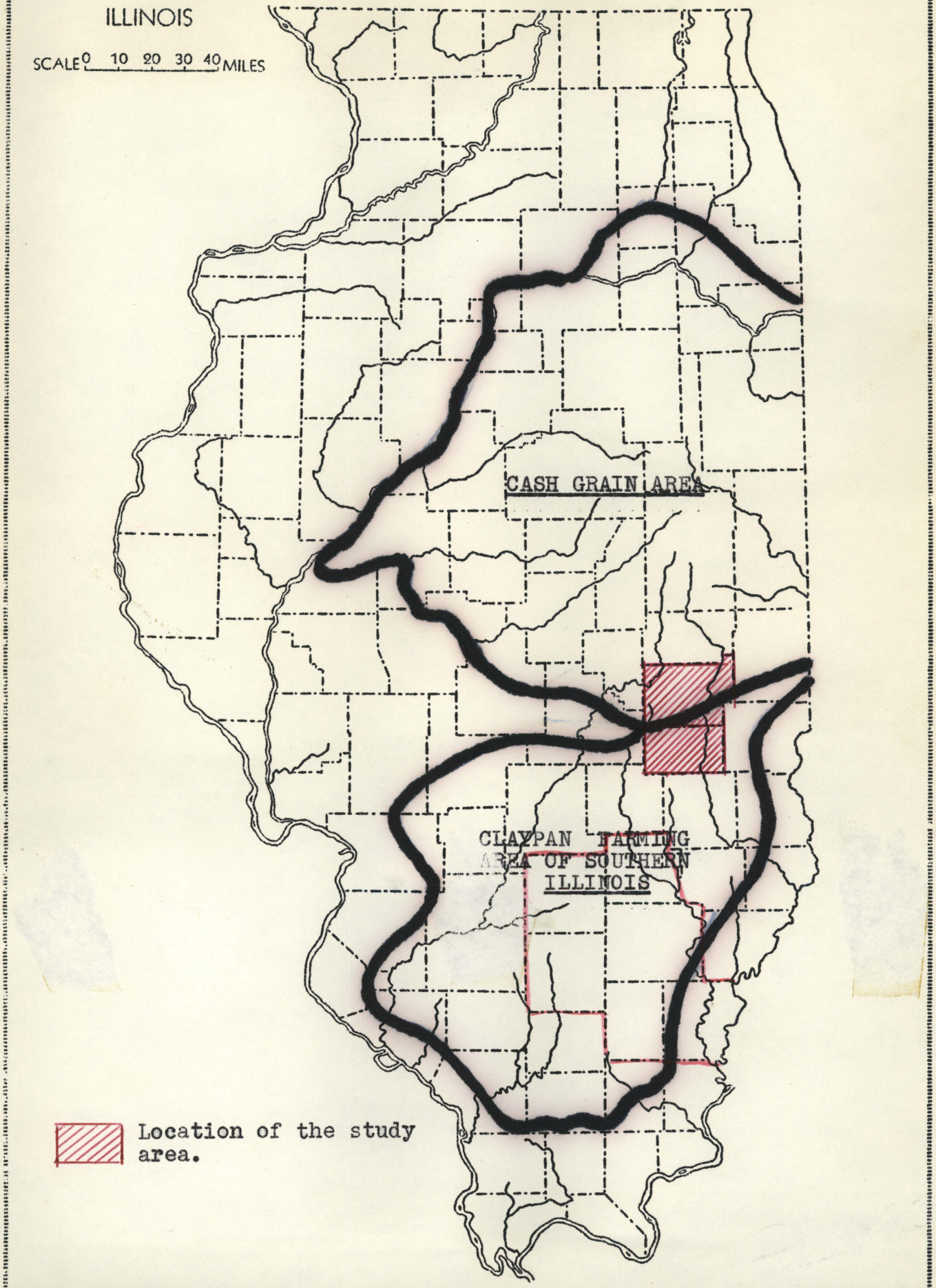

Fig. 1-1 - Relation of the study area to the Cash Grain and the Claypan region of Illinois . After Case, meyers, et.al.

and the Claypan Farming region of southern Illinois (Fig. 1-1). Both areas are approximately evenly represented and are divided by the Shelbyville moraine.

Indeed there are significant contrasts between the two major agricultural regions of Illinois. One is often taken back with the rapidity with which the observable features of the agricultural landscape change as one crosses the Shelbyville moraine from either the north or the south. There is nothing subtle about the rate or character of these changes. To the south of the moraine the interested observer is possessed with a feeling that the area he is traversing is one dominated by a stagnant and declining agricultural economy. The soils are yellow or yellowish grey and the fields appear to have been cleared from an area once dominated by timber. Remnants of that forest cover still occupy a considerable proportion of the available land (Fig. 1-2). Much of the land is in slope and one need not look far for the tell tale signs of gully and sheet erosion (Fig. 1-3). More often than not the farm steads are delapidated and sadly in need of repairs (Fig. 1-4). Very often there are signs of farm abandonment (Fig. 1-5). The fields, although being used, are enclosed by a network of fences, usually rusted, often disfunctional because of the sorry state of maintenance. Hogs, cattle, and occasionally some sheep, usually of no particular breeding line are seen on nearly every farm stead. The rural hamlets ordinarily consist of a general store and perhaps a few homes located in a grove at the intersection of two section roads (Fig. 1-6).

Fig. 1-2 Remnants of the forest cover.

Fig. 1-3 Gully erosion

Fig. 1-5 Farm abandonment in the claypan area.

Fig. 1-4 Delapidated farm stead.

Fig. 1-6 Rural hamlet in the claypan area.

Fig. 1-7 Flat Wisconsin drift.

By and large one can say that the area south of the Shelbyville moraine has the appearance of being an agricultural region of generally poor mixed farming.

On the other hand the area to the north of the Shelbyville moraine is one in which agriculture is the largest, dynamic, and most prosperous of economic activities. The soils are generally darker in color, higher in natural fertility, and twice as expensive per acre on the land market.[2] Broad prairies, gently undulating to flat extend to the horizon with only fingers of timber extending out onto the prairie along the streams (Fig. 1-7). There are here and there only isolated islands of timber to break the monotony (Fig. 1-8). In general the farmsteads consist of a large two-story house, guarded by a planted wind break, and dominated by the largest of the out buildings, the corn crib (Fig. 1-9). Long ranks of grain storage bins are seen frequently (Fig. 1-10). One of the most obvious features of the land scape as compared with the area to the south is the lack of fences. The large grain fields are not fenced which immediately gives the observer the clue that livestock production is secondary in the area.[3] Where livestock is an important part of the farming program one is very apt to see relatively large herds of fine grade cattle and hogs being fed together in

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[2] Interview, Coles County Farm Advisor, June 12, 1963.

[3] Survey Results, Agriculture in Coles and Cumberland County, (Prepared by the author, May 15, 1963).

large feed lots (Fig. 1-11). The practice of ranging cattle is not followed to a great degree.[4] The rural hamlets and villages occur in greater numbers on the northern prairie than is true in the areas to the south. Generally located at the intersection of the rail and section roads with a compliment of general store, gasoline pumps, fertilizer plant, and machinery repair garage is the grain elevator whose bold structure dominates the landscape and constitutes the tell tale evidence of the major agricultural activity in the area; cash-grain farming (Fig. 1-12).

These glaring differences in the appearance of the agricultural landscape occur across the Shelbyville moraine which is a rolling, timbered belt of remnant glacial deposition from seven to twelve miles wide. Within this so-called boundary area one will find only diversity. On the rugged southern flank of the moraine one is likely to be most unfavorably impressed with the general appearance of poverty of the farming enterprise (Fig. 1-13). Indeed there are numerous signs of farm abandonment; yet, the land is for the most part still under cultivation (Fig. 1-14). Along this southern margin of the moraine the topography is hilly, due primarily to the way the glacier deposited its load (Fig. 1-15). Yet, once one has reached the inner margin of the rough southern flank the surface of the moraine takes on a much different character. There is a gently

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[4]The term ranging cattle is used here to distinguish between feed lot operations and the practice of grazing cattle on extensive pasture as it is done in the western and southwestern states.

rolling, downward slope to the north until the moraine merges almost imperceptably with the youthful till plain.[5] This gently sloping morainal surface although originally timbered has been brought under cultivation to a large extent (Fig. 1-16). In addition there are many untimbered enclaves and fingers of prairie which reached well into the morainal area. The prairie enclave surfaces have provided attractive agricultural areas and exhibit most of the features which are characteristic of the cash-grain area to the north (Fig. 1-17).

Within the morainal area it is possible to find in close juxtaposition farms which exhibit the characteristics of both major areas to the north and south. Probably the most reasonable statement which could be made about the morainal area is that agriculture is merely undifferentiated in terms of any dominant type, but takes on some of the character of both agricultural regions. For a number of years the author has been aware of these apparent differences. A number of questions have arisen on various occasions in academic discussions concerning the validity of the Shelbyville moraine as a sharp boundary. Casual observations would definitely support the hypothesis that the moraine marks the boundary. But is it possible that the moraine is totally responsible for the apparent differences which one casually observes as he traverses the area from north or south? Perhaps there are other physical or cultural factors

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[5]Nevin M. Fenneman, Physiography of Eastern United States, (New York: McGraw-Hill Book Company, Inc., 1938), pp. 52-514.

which influence the choices of farmers in the three major sub-areas under study. If so, is it possible that these choices manifest themselves in such different ways? It is the purpose of this investigation to address to these possibilities an evaluation to discover the factors which account for the differences in a real appearance and to establish the proper relationships which give an insight into understanding the nature of the agricultural enterprise across the morainal transition as it exists at the present time.

CHAPTER II

THE ILLINOISIAN DRIFT SHEET*

The vast majority of the North American Midwest has been greatly altered on at least four different occasions by continental glaciation.[1] Coles and Cumberland county taken as a block of territory rather than two political units is an area where the two most recent stages of that continental glaciation are represented. The Illinoisian stage is the older drift surface and is found primarily in Cumberland county with the exception of about thirteen square miles of morainal land found north of Bradbury.[2] (Fig. 2-1)

The Illinoisian drift sheet once deposited by an ice lobe which extended to nearly the southern Illinoisian uplift area was subjected to a long interglacial period

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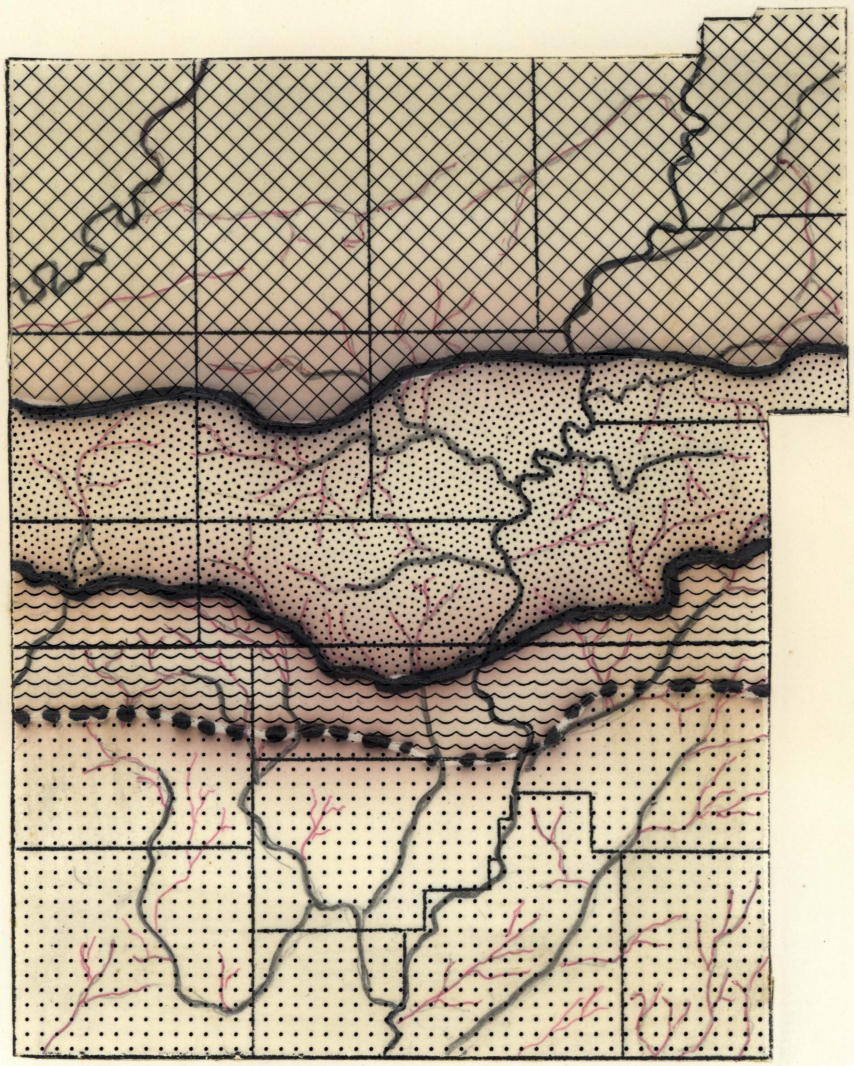
*Note: In this chapter entitled THE ILLINOISIAN DRIFT SHEET reference is made to the Claypan Area, and Cumberland County. It should be understood that the Illinoisian Drift Sheet is a glacial till plain, that the claypan type of soil has developed on the till plain, and that all except a very insignificant portion of Cumberland county is located on the till plain surface. In this chapter all reference will be considered synonymous.

[1]Nevin M. Fenneman, Physiography of Eastern United States, (New York: McGraw-Hill Book Company, 1938), pp. 452-456.

[2]R. S. Smith and L. H. Smith, Cumberland County Soils, (University of Illinois Agricultural Experiment Station, Soil Report No. 69, 1940), p. 7.

GENERALIZED PHYSIOGRAPHIC DIVISIONS



KEY

Wisconsin Till

Shelbyville Moraine (Wisconsin)

Outwash Plain (Wisconsin)

Illinoisian Till

Drainage Pattern

0 10

scale

Fig. 21

of erosion.[3] This large drift sheet was subsequently formed into a region in which streams had cut deeply into the level surface leaving low level flood plains parallel to the larger rivers and creeks surrounded by upland surfaces of a relatively flat or undulating character.[4] (Fig. 2-2, 2-3) The short, steep slopes between the drainage bottoms and the upland surfaces became the areas of most active erosion. (Fig. 2-4)

The Illinoisian drift sheet was subsequently veneered by a layer of angular clay sized particles of wind borne materials called loess.[5] It is probable that this material was deposited over the Illinoisian surface after the most recent Wisconsin stage of glacial deposition. The loess, which became the parent material from which the present soil developed, probably originated as an extensive winter deposit of water worked glacial rock material. Once the streams which were heavily charged with the fine, clay-sized particles, receeded during the winter periods the loess was deposited on the stream flood plains and thus exposed to the winds. The winds which blow from a westerly direction in the midwest carried the large amounts of loess onto the

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[3]Fenneman, p. 454.

[4]Ralph H. Brown, Historical Geography of the United States, (New York: Harcourt, Brace and Company, 1948), pp. 208-209.

[5]Fenneman, pp. 598-600.

Fig. 2-2. Low level flood plain.

Fig. 2-3. Upland surface.

Fig. 2- 4. Short slopes in the borderlands.

upland surfaces depositing it without regard to elevation.[6] At the present time these extensive loess deposits vary from several feet deep adjacent to the Mississippi River to only a few inches in areas farther downwind to the east. All of Cumberland county is covered.[7] (Fig.2-5)

Prior to the time the Illinoisian drift sheet was veneered by loess there developed a rather extensive cover of forest vegetation of the upland hardwood variety. (Fig. 2-6) Interspersed here and there were rather extensive areas of upland prairie.[8] (Fig. 2-7) This pattern of vegetation had a significant influence on the character of the soils which developed. The claypan region has two dominant soil types which represent this former vegetation cover. (See Plate III Appendix C) Basically these are the light gray prairie soils and the yellow to yellowish gray timber soils.[9] The light gray prairie soils developed under the grass vegetation and contained considerably more organic material. The grasses developed a shallow root system which accumulated over time through the seasonal rhythm of growth and decay.[10]

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[6] Ibid., p. 508.

[7] Smith and Smith, p. 7.

[8] Brown, p. 209.

[9] R. C. Ross, V. B. Fielder, and G. H. Walter, Farming in Cumberland County in the Claypan Region of Southern Illinois, (University of Illinois Agricultural Experiment Station, Bulletin 506, 1944) p. 286.

[10] Smith and Smith, p. 9.

Fig. 2-5. Loess bank.

Fig. 2-6. Upland hardwood vegetation.

Fig. 2-7. Upland prairie.

The soils which developed under the timber cover have very little, if any, organic content. The leaves and branches of the forest trees dropped and decayed on the surface. Only a thin organic layer of leaf mold remained. The percolating surface waters dissolved some of the acid content of the leaf mold depositing it, along with other solutions, at different levels in the soil profile.[11]

Another factor which was to complicate matters for farmers later was the development of a very slowly permeable subsurface layer which came to be known variously as hardpan, buckshot, blueclay and claypan. The layer consisted primarily of lime, phosphate, and clay minerals which had been broken down through chemical reaction of water and the loess parent material. The percolating action of surface waters deposited the various sized particles as a layer in the soil profile.[12] After a period of deposition the layer became so impervious to the downward movement of water that once the shallow top layer of soil had been saturated the water stood on the surface or ran off rapidly during seasons of excess precipitation. (Fig. 2-8) This condition hastened the process of leaching whereby the available mineral salts were dissolved and carried off by surface drainage or downward out of reach of the plants. Furthermore the alternating saturation and drying out of the soil layer stepped up the oxidation processes

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[11] Ibid., p. 9.

[12] Ibid., p. 9.

Fig. 2-8. Upland prairie with impervious claypan sub-soil.

resulting in the complete deterioration of the small amount of organic material available in the soil.[13]

When the first settlers began to populate the area which is now Cumberland county they found a region of remarkably flat uplands, very hilly border lands between the prairie and the bottom lands of the rivers and major creeks. The uplands were timbered with hard woods of the oak-hickory-maple association. The streams were paralleled with soft woods of the cotton wood and willow variety.

At first the region was adequate to support a rather small frontier population. The farmsteads had been located at the edge of the forests where there was easy access to timber and also to the prairie. The upland farms were cleared first because they were easier. But then came the advent of the great National road which, it was thought, would provide almost unlimited economic opportunity for the farmers of the areas as well as those who would follow soon.[14] Indeed in the 1840's the population of Cumberland county expanded rapidly. Greenup became a major business center; but, to the surprise of many of its citizens, it was strictly a farm town.[15] The great National road had not brought the great traffic which the towns people of Greenup had anticipated. Cumberland county was strictly a farming county and the rural population created a great demand for

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[13] Ibid., p. 9.

[14] F. A. Battey & Company, Counties of Cumberland, Jasper, and Richland, Illinois. Historical and Biographical. (Chicago: Ottaway Printing Company, 1884) pp. 149-150.

[15] Ibid., p. 150.

the available land. From the 1840's until well after the Civil War the demand and price for land was constantly rising.[16] Much of the marginal land was pressed into cultivation, particularily along the timbered borderlands between the prairie and the river bottoms.[17] These areas should never have been cleared. The economic loss of soil and the loss of protection from erosion of the loess material which resulted was severe.

Farmers found that Cumberland county was not a region favorably adaptable to agricultural specialization. The region was too hilly particularly near the edge of the prairie where erosion was most severe.[18] The flat prairie upland was extremely poorly drained. Once the region was densely settled the farms were too small in size to be adaptable to any sort of profitable extensive farming techniques. Furthermore, the soil was too infertile and the equipment of the day too crude to develop a system of agricultural specialization.

Farmers found that a system of general mixed farming was more in keeping with their needs.[19] From the beginning Cumberland county was an area in which corn, wheat, oats, and hay raised with a compliment of cattle and hogs was the typical farm program.[20]

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[16] Ibid., p. 147.

[17] Brown, p. 209.

[18] F. A. Battey and Company, p. 105.

[19] Ibid., p. 105.

[20] Ibid., pp. 105-106.

This situation has not changed to as great a degree as one might expect. Farmers in Cumberland county are still plagued with the problems associated with the slowly permeable subsoil. The only way that the surface waters can be drained is by the digging and constant maintenance of open surface ditches.[21] To attempt any sort of tiling which would extend beneath the subsoil claypan layer has been unsuccessful.[22] Attempts have been made to develop special plow attachments for breaking the claypan. In some cases there has been some success but it has only been temporary. At the present the only way that the claypan can be kept open is to plant the land in alfalfa.[23] The roots of the alfalfa will penetrate the slowly permeable layer. Of course such a program would prove to be impractical from the general farmers point of view.

The general farmer in Cumberland county is still an owner-operator of a relatively small holding.[24] Originally the farms were quite small; but as other economic opportunities developed in towns nearby and in the not too distant cities there was a slow but constant depletion of the farm populations. There was a general breakdown of the farms

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[20] Ibid., pp. 105-106.

[21] Interview, Robert H. Button, May 12, 1963.

[22] Ibid.

[23] Interview, Cumberland County Farm Advisor, June 21, 1963.

[24] H. C. M. Case and K. H. Meyers, Types of Farming in Illinois: An Analysis of Differences By Areas, (University of Illinois Agricultural Experiment Station, Bulletin 403, 1955), p. 188.

over time in terms of size due to the prevailing customs of inheritance. Many of these farms became so small that they would not support the families living on them. As a result there were many cases of literal farm abandonment.[25] However, many of these farms have now been bought and consolidated into larger units. But still the average size of farm does not seem to be easily adaptable to a great degree of agricultural specialization. (See Fig. 2-22) Probably the key to understanding why farmers have not specialized lies in the fact that it is difficult to consolidate a holding on which to conduct an agricultural economy of scale. With present fertilizing practices there is little difference in yield acre for acre between the claypan soils and those black prairie soils of the cash grain area.[26] (Fig. 2-10) The fact of the matter is that in a wet year when there is available water for the crops on the claypan farms they may equal, or even surpass, the yield of the black prairie farms to the north.[27] The main point of the argument is that the actual number of acres which can be consolidated in one large continuous surface for cash-grain production is limited by the amount of land in slope or timber. The physical condition of the dissected Illinoisian drift sheet is not conducive to large scale cash-grain specialization. (See Fig. 2-1) Evens if farmers were able to rent enough land to make specialization possible, the land would probably be in

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[25]Ross, Fielder, and Walter, p. 304.

[26]Coles and Cumberland Farm Advisors, June 21, 1963.

[27]Ibid.

AVERAGE CROP YIELD PER ACRE
(By Area)

AREA	CORN(BU.)	SOYBEANS(BU.)	WHEAT(BU.)	HAY (TONS)
WISCONSIN DRIFT PRAIRIE	113	35	40	2.5
MORAINAL AREA	98	34	40	3.0
CLAYPAN AREA	100	33	38	2.3

Fig. 2-10.

so many pieces and located in so many different places as to make the whole operation unprofitable.

It is the opinion of the farm advisors of both counties that the general farm will produce a consistant return of approximately one-third less than an equal sized cash-grain farm.[28] This means of course that with land at its present price a general farmer in the Claypan region with the proper management techniques and one-fourth less investment in a farm one-third larger than his cash-grain counterpart could realize the same return. More simply it would be one-fourth less of an investment to purchase a ninety acre farm in the Claypan area than a sixty acre farm in the cash-grain area. The return would be approximately the same.

In the Claypan area the crop rotation is basically the same as it was in the earlier days with some rather important exceptions. Corn and soybeans have come to be the two most important competitive cash-grain crops. (Fig. 2-11, 2-12) Formerly wheat occupied the second position. Not until prior to and during World War II did soybeans take their position as an important competitor of corn for the available agricultural land. Soybeans enjoy a wider range of environmental conditions than corn. They have, as a result, pressed the boundary of the cash-grain area ever southward so that now one finds it rather difficult to accept the Shelbyville moraine as the traditional boundary of the

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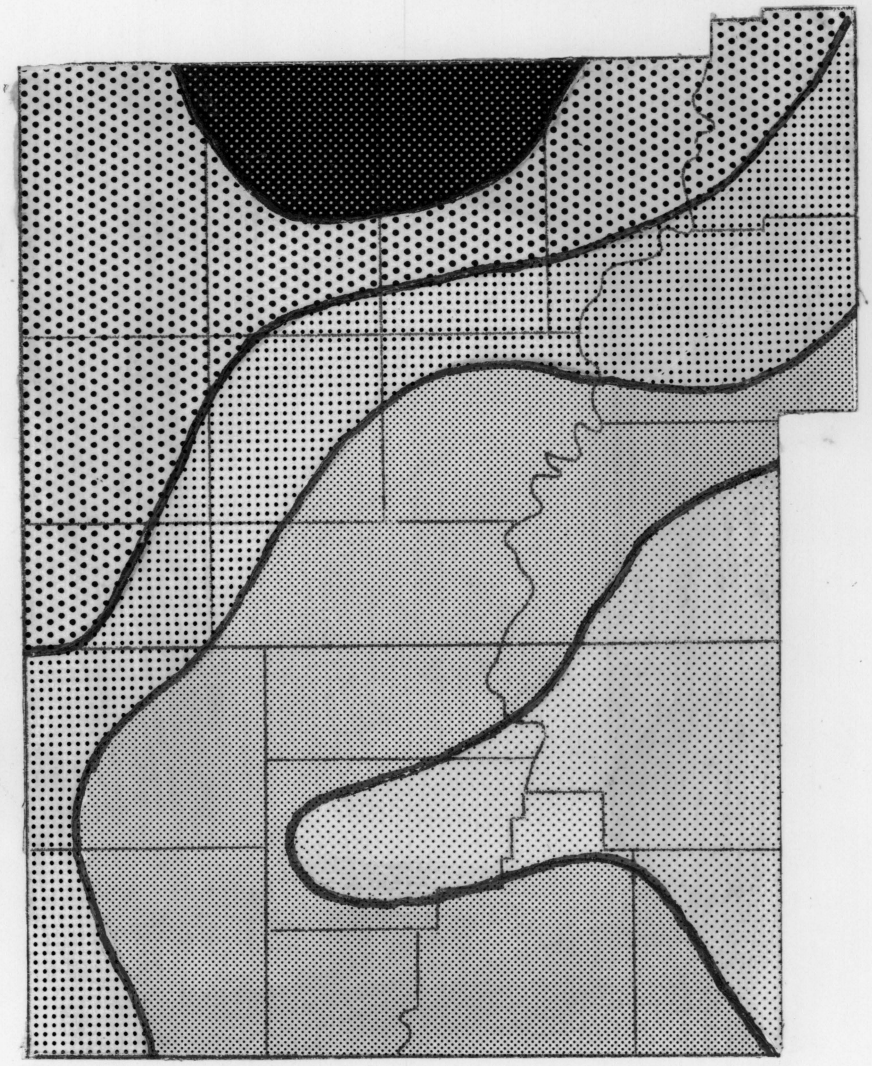
[28] Ibid.

CORN:

PERCENT OF LAND PER FARM



KEY

More than 40 %

35 - 40 %

30 - 35 %

25 - 30 %

Less than 25 %

0 — 10

scale

Fig. 2-11

SOYBEANS:

PERCENT OF LAND PER FARM

KEY

More than 26 %

22 - 26 %

18 - 22 %

Less than 18 %

0 10

scale

Fig. 2-12.

cash-grain area. (See Fig. 1-1) Indeed all of Cumberland county lies within the area of important soybean production as does many of the counties of central and southern Illinois. (See Fig. 2-12)

Wheat, is found growing ubiquitously in practically uniform amounts all over the study area. (Fig. 2-13) The government has provided a minimum price subsidy for this crop with the understanding that the acreages will be limited. The purpose is primarily to limit the development of additional surpluses. However, the wheat crop is an important component of the crop rotation and in the long run provides a valuable complementary function to the entire agricultural enterprise.

Prior to the introduction of the tractor and associated farming equipment, horses provided the main source of power for the various farming operations. Oats grown as a feed crop were significant. Once replaced by the tractor, however, oats took on a different function. It was found that oats could be planted as a nurse crop with various of the species of hay.[29] Clover, a legume, valuable as a hay crop was often planted with the oats. The oats provided an adequate protection allowing the clover to become established. Once the oats were matured they could be cut for a cash or feed crop. The clover could then be mowed and bailed for hay, or the seed harvested as a valuable cash crop. In this manner the oats could be grown as a supplementary

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[29]W. V. Lamber, Director, Economics of Cropping Systems in the Corn Belt, (The Experiment Station, University of Nebraska, Bulletin 429, 1955), p. 10.

DISTRIBUTION OF WHEAT BY TOWNSHIP

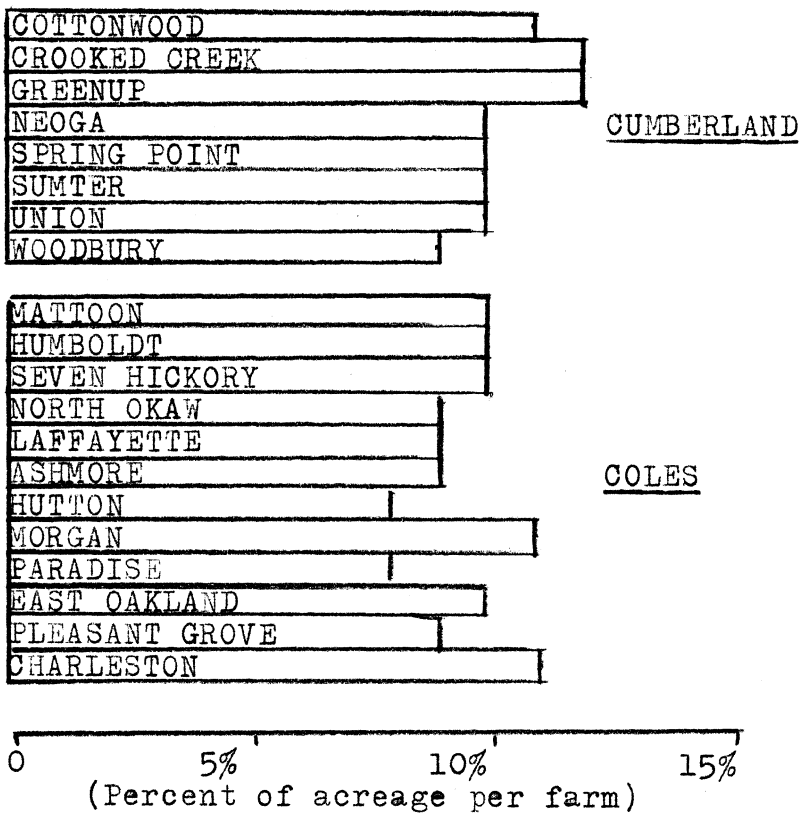

Fig. 2-13.

crop without competing for either available land or equipment.[30] (Fig. 2-14, 2-15)

In general it can be said that among the various crops used in the rotation in the Claypan area, corn and soybeans are the most valuable as cash-crops and compete for the most suitable acreages of land. (Fig. 2-11, 2-12) The flat upland prairies which have not been dissected to any great degree and the alluvial river and creek bottoms are the most prized areas for their production. (Fig. 2-16) Any place where the slope is not great enough to threaten severe erosion if planted in the row crops, there is apt to be corn and soybeans. However, one plot will not sustain much continuous cropping with any one crop.[31] Depletion of the soil will be the end result. Therefore, management practices which account for a rotation of crops over a period of years are the most effective. Because of this any two crops which would give an attractive return to the farmer, if planted on the same plot of ground, are competitive in the short run period.[32] In a mixed farming program, such as is characteristic of the Claypan area, it is possible for the farmer to plan and carry out a long run plan of crop rotation and land management in order that the complimentary and supplementary production relationships may be introduced.[33] Mixed farming must be a

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[30] Ibid., p. 10.

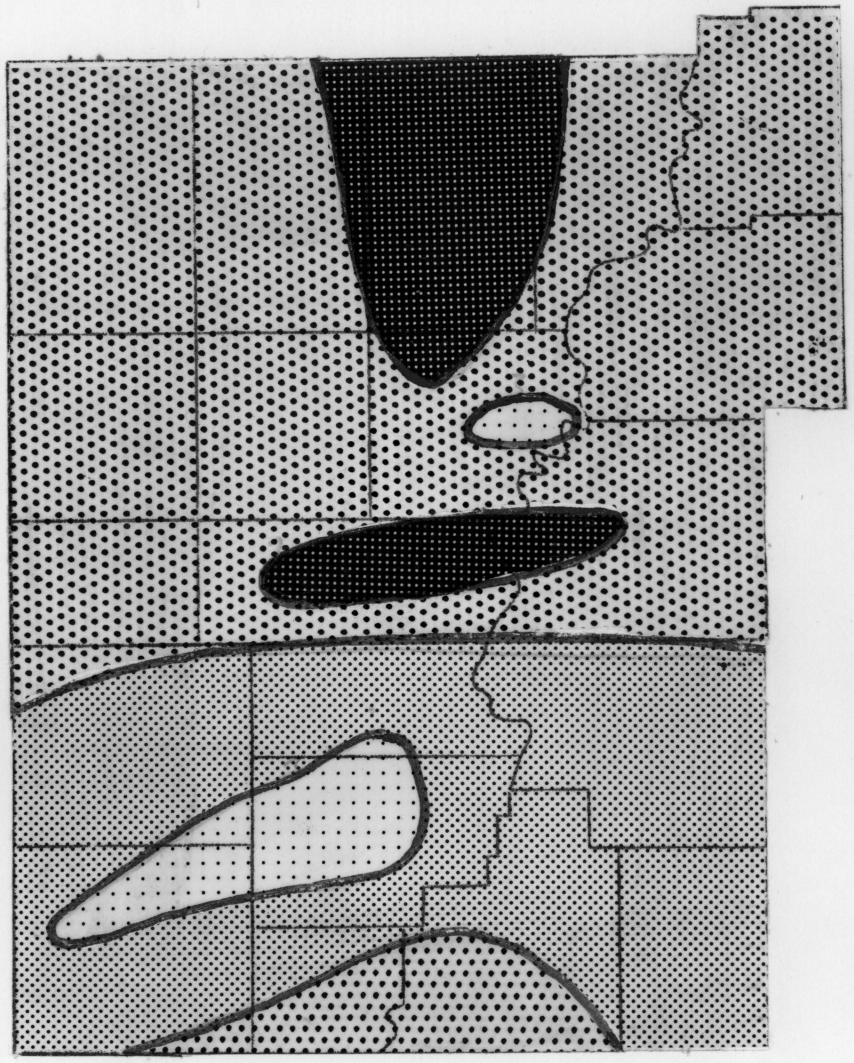
[31] Interview, Cumberland County Farm Advisor, June 21, 1963.

[32] Lambert, p. 12.

[33] Ibid., p. 17.

OATS:

PERCENT OF LAND PER FARM



KEY

More than 7 %

5 - 7 %

3 - 5 %

Less than 3 %

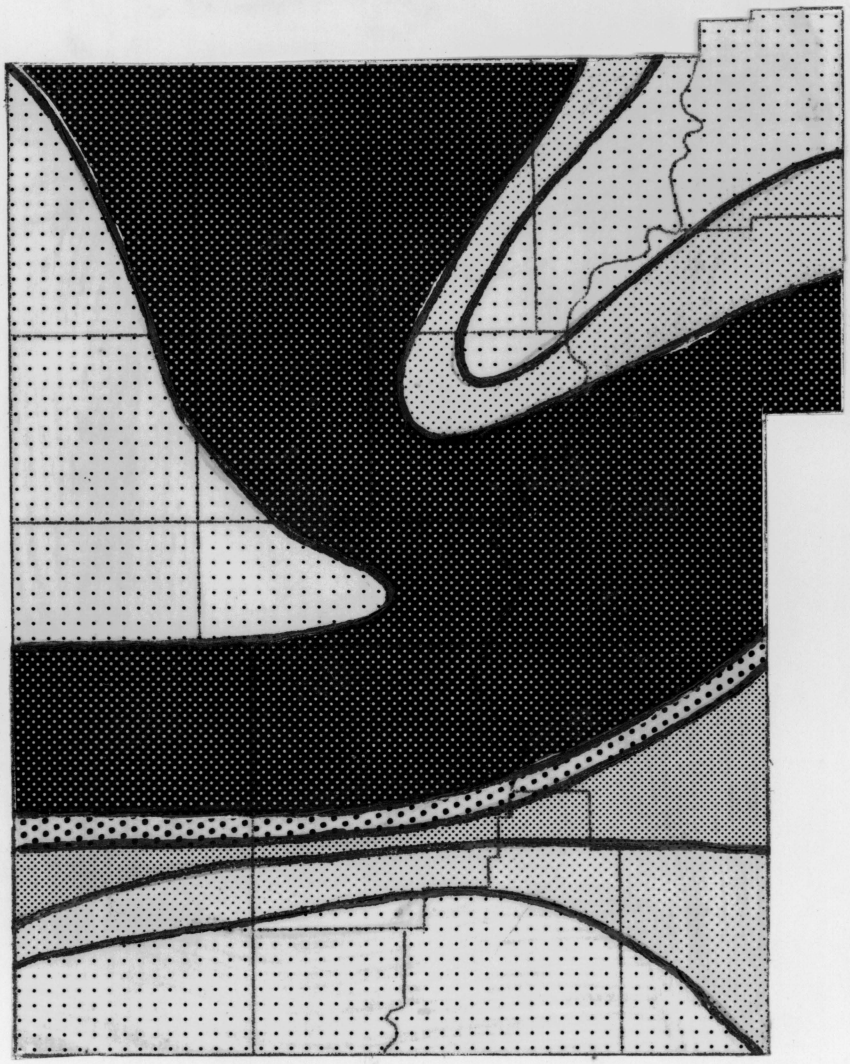
0 10

scale

Fig. 2-14.

HAY:

PERCENT OF LAND PER FARM



KEY

More than 18 %

17 - 18 %

16 - 17 %

15 - 16 %

Less than 15 %

0 ——— 10

scale

Fig. 2-15.

Fig. 2-16. River Bottom farming.

long range management operation in order to be profitable.[34] In the short run it can only result in the ruinous misuse of the soil.

Much of the land in the Claypan area which is in slope does not occupy a competitive position in terms of corn or soybean production. (Fig. 17) This hilly land is usually left idle, or in permanent pasture for livestock grazing. Most of the farms in the Claypan area have one quarter or more of their acreage in pasture. The greatest concentration of pasture is in the hilly northeastern section of Cumberland county where the Illinoisian till and the Shelbyville moraine make contact. (Fig. 18) However, hay production is more important in this area than livestock production. (Fig. 19)

Livestock production has always played an important role in the agricultural economy of the claypan area. (Fig. 20) (See Plate II, Appendix C) However, it would be misleading to say that there has been a wide-spread effort to specialize in livestock production. Most farms have several head of cattle, hogs, and perhaps sheep. The cattle are not generally of a particular type. It would be difficult to support a theory that beef cattle are numerous. Dairy cattle are even fewer with one important exception. Hogs and cattle seem to share a rather supplementary relationship in the feed lot as well as on pasture. Where cattle are fed corn in the lot, or grazed on corn in the picked over fields, there hogs are inevitably to be found also. Cattle do not

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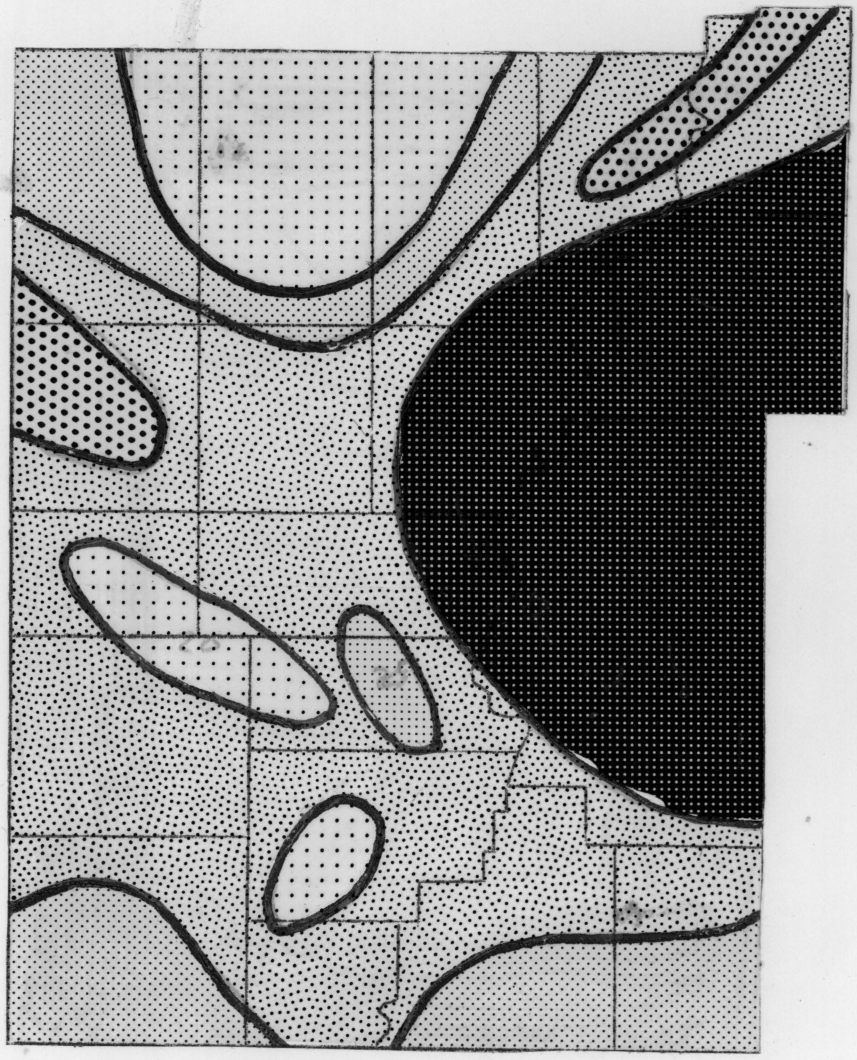
[34] Ibid., p. 17.

Fig. 2-17. Non-competitive land.

Fig. 2-18. Pasture in the Illinoisian hill lands.

PASTURE:

PERCENT OF LAND PER FARM



KEY

More than 35 %

30 - 35 %

25 - 30 %

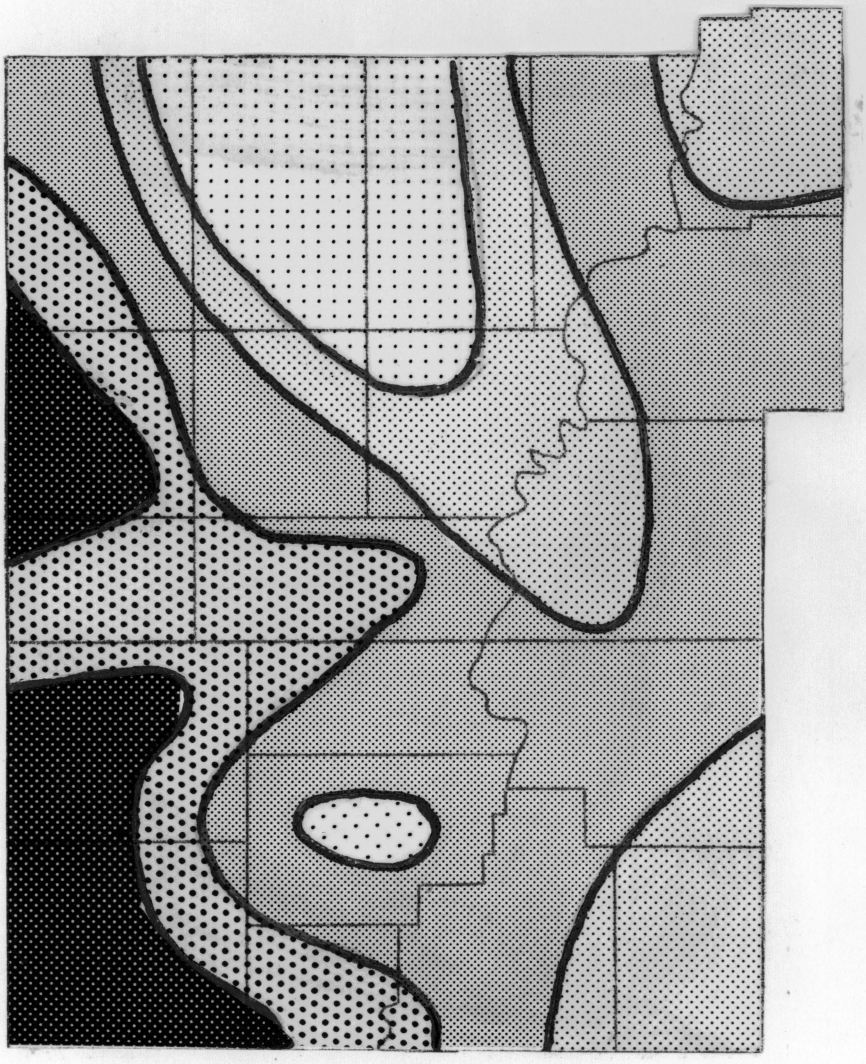
20 - 25 %

Less than 20 %

0 scale 10

Fig. 2-19

DISTRIBUTION OF ALL LIVESTOCK



KEY

More than 50 head

40 - 50 head

30 - 40 head

20 - 30 head

Less than 20 head

0 10

scale

Fig. 2-20

digest corn readily and large amounts are passed in the elimination process. Hogs which are by nature scavengers thrive on the undigested corn which they find. Such a relation, although rather on the sickening side, is profitable.[35]

The only section of the Claypan portion of the study area which shows any signs of livestock specialization is in the southwestern quarter of Cumberland county. In the area of centering around the town of Montrose, Teutopolis and Effingham there has developed a rather intensive pattern of dairy farming. This is an area in which the population is sparse and the farms are among the smallest in the county. (Fig. 21-22) No doubt the concentration of the dairy enterprise may be explained to a great extent by the fact that this is an area heavily settled by farmers of definite German ancestory. In no other section of the Claypan area is there such a concentration of dairy farming. (Fig. 23)

In general it may be said that livestock production occupies an important but non-specialized position in the organization of the farm management plan in the Claypan area. Livestock production is ubiquitous but uneven in terms of absolute production. The primary reason for production is to take advantage of the large proportion of land which is fit only for the raising of pasture and to provide a means whereby lower priced grain may be converted into higher priced meat.[36] The market relationship existing

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[35] Interview, Robert H. Button, May 12, 1963.

[36] Lambert, p. 14.

between costs of producing grain for a cash-crop and buying or growing grain for feed will determine, in part, the degree to which a farmer will specialize in livestock production.[37] Another factor which must be given consideration is the matter of labor. In the mixed farming situation the farmer will be occupied the year around. In as much as the labor involved in handling a beef or dairy herd will bring a return over the cost it is a profitable off-season operation. (Fig. 2-24) Another factor which has become important in the farming program in the Claypan area is the practice among many of the farmers of finding employment during the winter season in occupations other than farming. Indeed, in many cases farming has become the secondary activity. There are a number of towns outside Cumberland county which provide attractive employment. For example, there are a number of farmers from the Claypan area who find steady employment in the chemical and petroleum refining industries at Tuscola and Robinson. Mattoon and Effingham also provide other employment opportunities in various manufacturing industries.[38] Furthermore, most of the tradesmen who find seasonal employment in the villages in Cumberland county are farmers. These men find that it is possible to earn attractive income at regular hours and still find time to farm. It would be difficult to say which of their

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[37] Ibid., p. 14.

[38] Edwin D. Golfield, Director, COUNTY AND CITY DATA BOOK, (Washington, D. C.: United States Government Printing Office, 1962).

activities are more important. In either case one of the two activities is supplementary and indicates a practice followed for the purpose of extending productive labor more uniformly over the year.

CHAPTER III

THE WISCONSIN DRIFT SHEET

The Wisconsin drift sheet is the most recent glacial deposition in the state of Illinois. The southern extent of this deposition is marked by the Shelbyville terminal moraine.[1] Although the moraine is referred to in this study as a separate area, it is none-the-less, a structurally associated extension of the Wisconsin drift sheet.

In contrast to the Illinoisian drift surface, which has been subjected to a long period of erosion, the Wisconsin drift sheet has not, as yet, reached a stage in the erosion cycle where its surface is extensively dissected. On the contrary, a distinguishing physical feature of the newer drift sheet is its flat, unbroken surface. (Fig. 3-1) There are few postglacial streams which exhibit the physical characteristics of mature development. This physical characteristic has come to be of the utmost significance in the development of a distinctive type of agriculture.

The soils which developed on this extensive, unbroken surface were associated with the extensive grass cover.[2]

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[1] Garland, p. 96.

[2] R. S. Smith, E. E. DeTurk, F. C. Bauer, and L. H. Smith, Coles County Soils, (University of Illinois Agricultural Experiment Station, Soil Report No. 44, 1929), p. 5.

Whereas the Claypan region to the south had been dominated by timber with interspersed areas of prairie, the Wisconsin drift sheet was dominated by grass with interspersed areas of timber.[3] (See Plate IV, Appendix C) There were long galleries of timber extending onto prairies but they were the lowland soft wood varieties which were found mainly along the streams. Large timbered areas were not characteristic on the prairie and where groves did occur they were almost inevitably the sites in which settlements later grew. (Fig. 3-2)

The grass vegetation which developed on the prairie was probably related to two main factors. In the first place the drift sheet was very flat to undulating and, therefore, not conducive to good drainage. The soils which were of a very fine grained nature did not allow for fast surface drainage. These combinations of mucky surface soils and poor drainage gave rise to marsh conditions in which grasses were the first to become established.

Furthermore, there is an important element of time. The type of vegetation regime which develops in a region develops from the more simple species of grass to the much more specialized species of trees. The Wisconsin drift sheet, being much more recent than the Illinoisian had not developed the extensive forest cover prior to settlement.

The dominant grass vegetation which thrived in a marshy condition gave rise to a soil type which has become a

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[3] Ibid., p. 5.

distinctive characteristic of the Wisconsin drift sheet. The root network put down by the grasses formed an abundance of organic material. The marshy conditions allowed for a rapid decay of the grasses and stepped up the processes of soil development. This situation has led to a soil type whose subsequent productivity has gained world renoun.[4] These black prairie soils are high in organic content and lime. They have the capacity to hold much greater amounts of moisture for longer periods of time. There has not been an extensive veneer of loess deposited over the newer surface and the layer of claypan sub-soil has not developed. Thus the black soils allow a much greater amount of moisture to be stored in the soil. These characteristics are in direct contrast to those of the Claypan area to the south.[5]

Settlement did not come to the prairies early. The people who settled in the area which is now Coles county occupied the morainal areas first. Most of these people had moved into the area from the south where timber was far more abundant. Timber or easy access to it was a key item in the success of early settlement. The early farmers believed that if the prairie could not support timber it would be too poor to support good crops.[6] What a change the future would bring! The prairie posed a major problem in its early stages

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[4]Garland, p. 40.

[5]Ross, Fielder, and Walter, p. 277.

[6]Brown, p. 208.

of development. Equipment used in that day was crude and the prairie sod was deep. The marsh conditions and the mucky soil proved to be a major handicap for the early farmers.[7]

After the Civil War, however, the area was brought under large-scale drainage projects. It was possible to drain the surface waters by either tilling or by digging large drainage ditches. These methods persist to the present time. (Fig. 3-3)

Once the prairies were brought under drainage projects and the sod had been broken, Coles county northward through all of east-central and north-eastern Illinois came under agricultural production. What had been a major problem area to farmers was to become the agricultural heartland of North America.[8]

When the vast prairies were first opened it was possible for farmers to obtain blocks of land which were more than they could operate by themselves. The equipment of the day imposed a physical limit on the amount of land which could be brought under cultivation by one family. This situation quickly led to a practice of renting the excess land to a tenant. Almost from the beginning the tenant farmer was an important factor on the prairie. (Fig. 3-4) To add to this trend was the fact that many monied families accumulated vast acreages of land. Land speculation proved to be very lucrative

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[7] Garland, p. 96.

[8] Ibid., p. 97.

after the prairies finally proved profitable for agriculture. It was useless for absentee landlords to own such estates if they were not productive so the land was rented out to tenants on various profit sharing plans. In one sense it may be said that from the beginning the unbroken prairies made a new kind of market possible. It was a farm rental market in which the landlords sought the labor and machine services of tenants. Tenants sought the use of land and land improvements owned by the landlords.[9]

This practice is still prevalent today. East-central Illinois, of which Coles county is a part, is an agricultural region characterized by a cash-grain type of farming, by highly productive and high valued land, and by a high rate tenancy.[10] In this prairie region "slightly over one-half of the farms are operated by full tenants while another one-fifth of the farms are operated by smaller landowners who rent a large part of the land they operate."[11] In Coles county over half of the farm land is operated under lease.[12] The nature of farm leases, therefore, are important in understanding the present patterns of agricultural production in the prairie.

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[9]Franklin J. Reiss, Farm Lease Practices in East-Central Illinois, (University of Illinois Agricultural Experimentation, Bulletin 677,) p. 3.

[10]Ibid., p. 3.

[11]Ibid., p. 3.

[12]Interview, Coles County Farm Advisor, June 23, 1963.

Perhaps the major function of a lease on farmland is to separate the rights of possession and use from the total obligation of ownership. A farm lease makes it possible for a tenant farmer to be the operator of an adequate acreage of farmland without meeting the capital and other requirements for owning that land.[13]

Another important function of the lease is to specify the terms and conditions which surround the transfer of rights in farmland. That is, it records the rights and privileges, the duties and obligations, and the commitments of both landlord and tenant under the contract.[14]

The practice of the terms of the various types of leases have been translated to observable characteristics of the agricultural landscape of the Wisconsin drift prairie. Basically there are three types of leases prevalent in Coles county. The crop share and crop-share-cash leases are the most similar and popular except for some form of supplemental cash rent. Both usually give the land owner two shares of the crops grown as rent for the farm, but the crop-share-cash leases include a cash rent payment in addition to the share of the crops. This cash rent is most frequently a payment per acre on tillable land used for hay and pasture crops. Such crops do not readily lend themselves to a share rent.[15]

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[13] Franklin, p. 6.

[14] Ibid., p. 6.

[15] Ibid., p. 7.

Fig. 3-4. Tenant house.

Livestock-share leases extend the practices of giving a share of the income from livestock enterprises as rent to the landlord. These leases may have many of the characteristics of partnerships. They usually call for an equal sharing of returns for all crop and livestock enterprises.[16]

To balance off the tenants labor input, the landlord contributes more items of equipment and some operating capital. He usually shares equally with the tenant the cost of purchased feed and in other operating expenses.[17]

The terms of the lease not only spell out in detail the manner in which costs of operations and profits will be shared but also the length and security of tenure for the tenant. The terms of tenure decide to a great extent the cropping practices which will be followed. For the tenant who does not know whether he will be on the farm for more than a year, certain cropping practices cannot be considered profitable.[18] To illustrate this point, suppose a tenant is given a lease for only a period of one year. In this case it would not be profitable for either the landlord or the tenant to plant a well-balanced rotation of crops. Only those crops which would bring the greatest immediate return, namely corn or soybeans would be planted. If the security of the tenant were not insured there would, no doubt,

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[16] Ibid., p. 8.

[17] Ibid., p. 8.

[18] Lambert, p. 8.

be a wholesale abuse of the soil due to over specialization in one or two cash crops. The rotation would probably cease to exist as a profitable management practice. In the long run both the landlord and the tenant would lose because of the depletion of the soil through overspecialization.

This loss can be prevented by providing a long period lease, thereby allowing the tenant to engage in a long range management plan in which crop rotation practices can be profitable.

The types of crops that are grown in the Wisconsin drift prairie are the same as those grown to the south. Production relationships are basically the same. (See Plate I, Appendix C) However, since the prairie is for the most part unbroken by erosion there is more competition between crops for the available land. On the flat, blacklands a hay field may exist on the same plot occupied by corn or soybeans the year previously. Needless to say, the corn or soybeans would bring the greater return if an arbitrary decision were not made to rotate the cropping of the land. This situation is precisely the reason why the security of tenant farmers is of the utmost significance. Only over long periods will the return from a rotation management plan be realized.

On the Wisconsin drift sheet, like the Illinoisian drift surface to the south, corn and soybeans are the two most competitive cash crops for the available land. (See Fig. 2-11, 2-12) Corn occupies one-third of all the available farmland, soybeans only about one-quarter. (See

Appendix B) The difference in acreage given over to these crops is reflected by the differences in price for the grain.[19]

Wheat, which is an important cash-grain in the rotation, is grown uniformly over the area and occupies the same proportion of land as in the Southern Claypan section. (See Fig. 2-13) Wheat which has minimum price support provides a dependable cash crop but is limited in acreage by government policy.

Oats and hay are grown in the same supplementary relationship as in the Claypan area. (See Fig. 2-14, 2-15) Oats are utilized as a nurse crop for the hay which provides seed, forage and perhaps a soil building legume.

A far smaller percentage of land on the prairie is occupied by timber or idle lands as compared with the Claypan area. (Fig. 3-5, 3-6) This is due to a great degree to the smaller original amount of timber and to clearing of existing groves.

The concentration of livestock is not as great in the prairied section as in the moraine and Claypan area to the south. (See Fig. 2-20) Although there are a number of sizable herds of both beef, cattle, and hogs, their numbers are misleading in relation to the size and number of farms. (See Plate II, Appendix C) The vast majority of the land is given over to cash-grain production and as stated previously the livestock-share type of landlord-tenant relation is more

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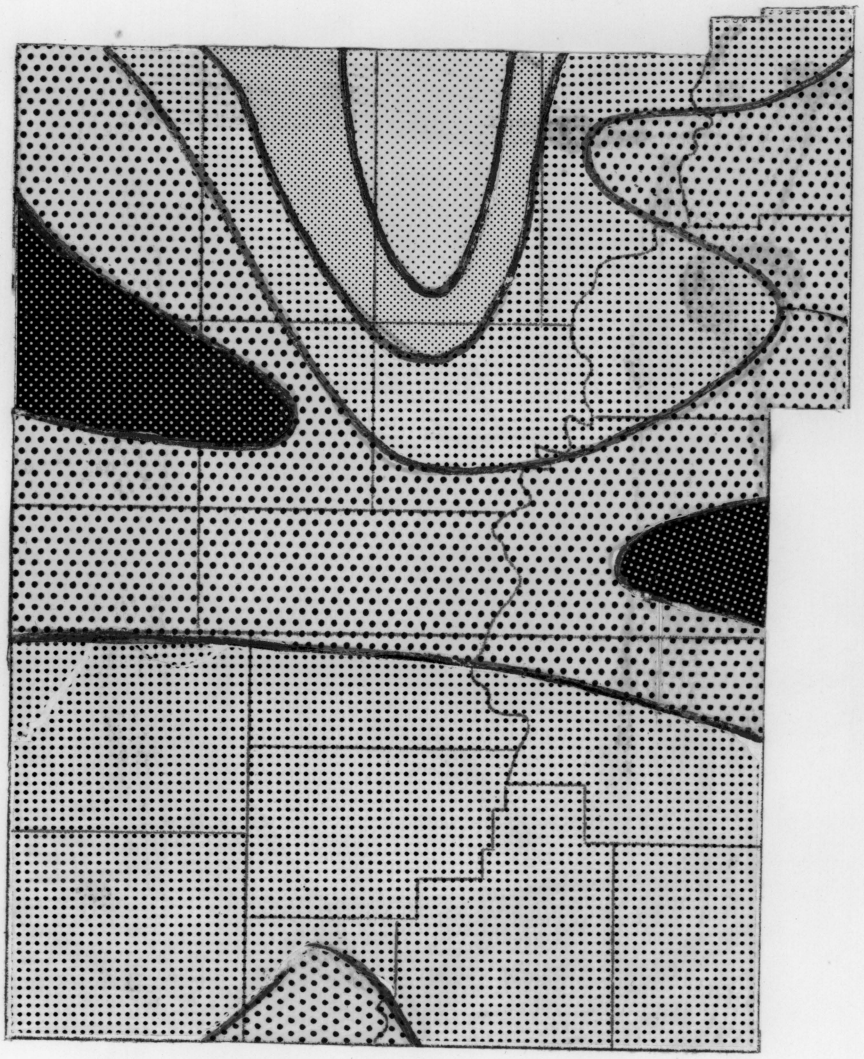
[19] Ibid., p. 6.

Fig. 3-5. Treeless Prairie.

OTHER LAND USE:

TIMBER , SOIL BANK , IDLE LAND



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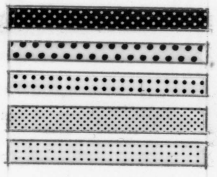

More than 30 % per farm
20 - 30 % per farm
10 - 20 % per farm
5 - 10 % per farm
Less than 5 % per farm

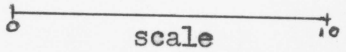

Fig. 3-6.

awkward. Cash-grain specialization is more popular in that the easy sale of the crops for cash makes the settlement of tenant-landlord business matters more expeditious.[20] (Fig. 3-7)

Where livestock is an important part of the farm enterprise hogs and beef cattle dominate. (Fig. 3-8, 3-9, 3-10, 3-11) Dairying and sheep operations on the prairies are very minor. (See Plate II, Appendix C) Beef cattle are the most popular livestock enterprise.[21] Cattle and some hogs are usually fattened together in the feed lot. Hogs show some concentration where there is rougher land related to river and creek erosion. Such land is not as competitive among the cash-grain crops and may be given over to pasture. Hogs, although they occupy a secondary position to cattle in the cash-grain area are increasing in popularity particularily farther north. Herds have been increasing in size in recent years.[22]

Extra-agricultural economic activities are not as widespread among the farmers of the Wisconsin drift prairies as among the farmers in the Claypan area. This can be explained, in part, by the fact that a much smaller percent of the population of Coles county as compared with Cumberland county is actually engaged in agricultural pursuits.[23] Furthermore the degree of cash-grain specialization and its

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[20] Garland, p. 98.

[21] Ibid., p. 43.

[22] G. G. Judge and E. R. Swanson, Adjustments In The Size of Beef and Hog Enterprises, Illinois Agricultural Economics, (University of Illinois Agricultural Experiment Station, Vol. 2, No. 2, July, 1962), p. 32.

[23] Goldfield, County and City Data Book.

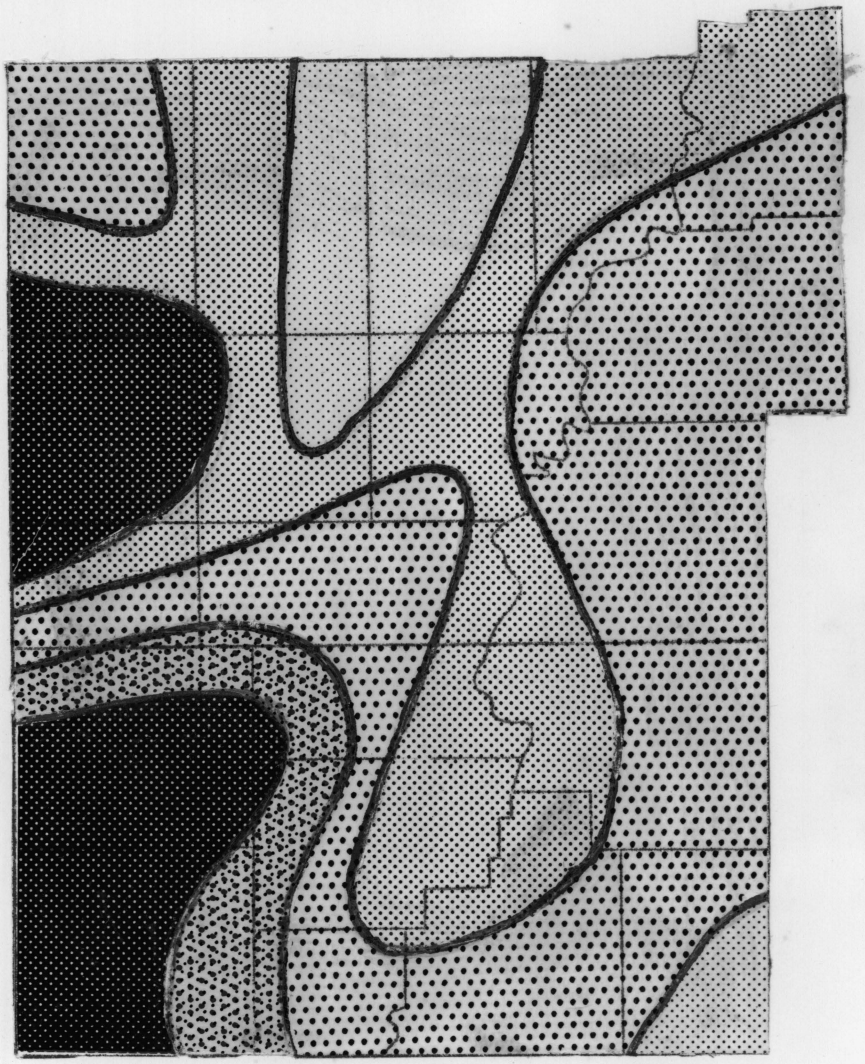
Fig. 3-7. Grain handling facilities.

Fig. 3-8. Hog operation.

Fig. 3-9. Feeding beef cattle.

BEEF CATTLE:

NUMBER OF HEAD PER FARM



KEY

More than 20 head per farm

15 - 20 head per farm

10 - 15 head per farm

5 - 10 head per farm

Less than 5 head per farm

scale

Fig. 3-10.

HOGS:

NUMBER OF HEAD PER FARM

KEY

More than 15 head per farm

10-15 head per farm

5 -10 head per farm

Less than 5 head per farm

0 10

scale

Fig. 3-11.

profitable consequences and the lack of a widespread all-season livestock feeding program has not forced the farmer to extend his labor throughout the year. Indeed, this profitable cash-grain enterprise has led someone to coin a remark which summarizes the activities in the area. The farmers of the cash-grain region are said to be C. B. F. farmers: corn, beans, and Florida!

CHAPTER IV

THE SHELBYVILLE MORAINE

The Shelbyville moraine is a belt of territory which represents the termination of the Wisconsin stage of continental glaciation. Structurally and in age it is a part of the Wisconsin drift sheet. However, the rougher topographic features justify its separation from the flat undulating prairie to the north in terms of both the agricultural activities and in terms of its physical structure.

The morainal belt may be divided structurally into three distinct sections all of which have different agricultural characteristics. These divisions will be referred to as the upland surface, the rugged depositional front, and the outwash apron. It should be understood that these divisions are generalized. There are some surface variations from one part of the morainal surface to the other but these variations result primarily from stream erosion.

The upland surface is the section which slopes upward to the south and which was formed by the overriding action of an ice lobe over its own deposition. It is apparent that the tremendous forward power of the ice sheet had been

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[1]Fenneman, p. 513.

spent by the time it reached the southern limit of the moraine.[2] The ice sheet was melting at about the same rate of forward advance. As a result the material carried in frozen suspension was deposited in rough, overlapping ridges near the ice front. Once the ice sheet had melted in place the rolling topography of the wedge shaped upland surface was formed.[3]

As the ice lobe melted away there was extensive overspilling action of the glacial waters. The unsorted materials carried in frozen suspension were washed over the ice edge forming a narrow depositional band of course unsorted boulders, gravel, and sand. (Fig. 4-1) This material now forms the rugged depositional front of the moraine.[4] (Fig. 4-2) From the south this belt of rugged topography may be seen as a bold ridge running generally from east to west. Contrary to many popular notions this belt of rough topography does not constitute the total extent of the moraine.

The glacial melt waters were more able to carry the finer particles of rock materials in suspension to locations more distant from their source. As a result of the grading action of running water these smaller rock particles were distributed according to size from the rugged morainal front southward. This depositional action of the over-

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[2] Ibid., p. 513.

[3] Ibid., p. 514.

[4] Ibid., p. 514.

spilling melt waters formed a gently down sloping outwash plain.[5] This plain is of the same age as the Wisconsin drift sheet. These are the three structurally associated features, all formed under different sedimentary environment; which constitute the area referred to in this study as the Shelbyville moraine.

All three of these features were veneered by the same loess material which cover the Illinoisian drift sheet.[6] The configuration of the moraine is controlled by the deposition of till. But the soil has developed on the loess parent material.[7] (Fig. 4-3)

These physical conditions, although not of significance to the study in their own right, are indeed significant when analyzed in terms of the influence exerted on agricultural practices in the morainal area.

The soils which developed in the moraine are for the most part undifferentiated in terms of locations. (See Plate III, Appendix C) The two types which are to be found most frequently are those which developed under both prairie grass and timber. There was an invasion of both forms of vegetation from the north and the south. The well established forest cover on the Illinoisian drift sheet invaded from the south with rapidity. The well drained depositional front was soon heavily forested with species of the upland hardwood varieties. This timber

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[5] Smith and Smith, p. 9.

[6] Smith, Deturk, and Smith, p. 5.

[7] Ibid., pp. 5-6.

invasion continued northward to the flat, poorly drained prairie of the Wisconsin drift sheet. The faster growing grasses of the prairie encroached upon the morainal area from the north. Extensive fingers and enclaves developed between the areas occupied by the timber. (Fig. 4-4) Although there was no systematic pattern of development for either the grasses or the timber there developed soil types which were characteristic of the areas occupied by these forms of vegetation.[8]

The soils which developed under the timber cover are similar to those timber soils found in the Claypan area. The significant difference lies in the fact that the morainal soils, although developed on the same loess material, have no well developed Claypan layer.[9] Thus the morainal timber soils which are low in organic material are well drained of both surface waters and the downward percolation of ground water. This condition leads not only to poor water retention characteristics but also to an increased rate of decomposition of organic material. The constant alternation of saturation and dessication of the small amount of organic material leads to almost a complete deterioration of the valuable soil material.

On the area of the moraine where prairie grasses have developed the soil is far richer in organic material. As

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[8] Ibid., pp. 5-6.

[9] Ibid., p. 5.

on the prairie to the north this is due to the dense accumulation of grass roots. The basic difference in the morainal prairie soils and those to the north is the amount of loess parent material. Whereas the black soils to the north are mucky and more slowly permeable the morainal prairie is loamy and more quickly permeable. These conditions increase the rate of water loss, and as was true in the forest soils, lead to a more rapid deterioration of the organic material.

There are many other small, randomly distributed pockets of soil in the morainal region. These range from dense black marsh soils to literal piles of cobbles. The soils of the morainal area are indeed an undifferentiated mixture. (See Plate III, Appendix C)

Farmers occupied the morainal area much sooner than the prairie to the north. The farmers who moved into the area were from the border states to the south. The prairie seems to have stopped their northward migration for a number of years.[10] One longtime resident and farmer from the prairie country is quoted as saying "there was nothing out on that infernal prairie but swamps, rattlesnakes, and blue tailed flies".[11] Such an environment was not inviting to the woodland farmers from the south. The morainal area was quite a familiar sort of area for them to settle. There was an abundance of timber, adequate prairie enclaves and fingers for easy clearing and land which provided good

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[10] F. A. Battey and Company, p. 149.

[11] Interview, W. Everett Tuggle, July 3, 1963.

pasture for livestock. Water accessability was not a serious problem. Furthermore, the railroads had not penetrated into the marshy prairie and navigable streams which could have carried settlers further inland did not exist. These factors along with serious shortages of timber made settlement difficult in the early period.

The present farming practices in the moraine constitute a mixture of techniques used in the northern prairie and in the Claypan area. As is true in both the northern prairie and the Claypan area, corn, soybeans, wheat, oats, and hay are the main crops in the morainal farm rotation. The rolling upland prairie of the area is quite similar to the cash-grain area to the north in terms of both the concentration and rotation of crops as well as the land lease relations between landlords and tenants. (See Appendix B) With the exceptions of areas which are either too rolling or dissected by severe stream erosion the upland prairie section appears to be merely an extension of the cash-grain area. (See Plate I, Appendix C)

Such is not the case in the rough borderlands between the upland prairies and the stream bottoms, or along the rugged depositional front. In these areas the same crops are grown in the same relationship and for the same purposes but the management practices are similar to those carried on in the Claypan area. Farms are much smaller by and large. (See Plate I, Appendix C) Cash-grain crops such as corn and soybeans compete for the small amounts of level prairie land and the stream bo toms. (See Fig. 2-11, 2-12) Wheat

occupies the same relative position as in all of the other areas under study. (See Fig. 2-13) It is distributed uniformly over the rough area and occupies about ten percent of the agricultural land.

The significant difference between the moraine and the Claypan area is in the amount of land given over to hay, oats, and other le s productive land use. (See Fig. 2-14, 2-15, 3-6) This pattern can be explained primarily in terms of the degree of slope, and the resultant problems of erosion control. In areas where cash-grains cannot be grown without chancing severe soil erosion hay and oats are grown or the area is left in timber. The morainal area has a much larger percentage of its land either in marginal production or idle than is true with any other part of the study area. (Fig. 4-5)

In these rougher sections of the moraine, livestock is much more important than cash-grain farming. Hogs and beef cattle are the most popular varieties of livestock. (Fig. 4-6, 4-7) However, dairying is far more important than in the northern prairie sections. (Fig. 4-8) The dairying operation appears to be the northern margin of the operations concentrated in the southwestern section of Cumberland County. Sheep production, which is very minor on the northern prairie is rather important in the rough depositional front area of the moraine. (Fig. 4-9, 4-10)

Immediately to the south of the rough belt of gravelly deposition is the outwash surface of the moraine. (See Fig. 2-1) On this well drained, gently sloping surface many streams rise but they have not thoroughly dissected the outwash plain.

Here is an area lying between the rough Illinoisian surface to the south and the rough depositional front of the moraine to the north which is remarkably flat. (Fig. 4-11) On this surface which has been cleared of timber for the most part is a pattern of agricultural activity almost identical to that of the northern prairie. (See Plate I, Appendix C) Cash-grain production is the main activity. (Fig. 4-12, 4-13) The landlord tennant relationship prevails. Farms are, generally, larger, except along the borderlands where the stream erosion has roughened the topography to a greater degree. Livestock is far less important than in the rougher morainal section but where livestock operations are found they are of the same nature as those in the northern prairie. That is, beef cattle dominate and hogs are a close second in the feed lot. Sheep are more significant than in the north, but less important than in the south. (See Fig. 4-10) In the western section of the outwash area is an extension of the dairying enterprise which is so significant in the western part of the Claypan area. (See Fig. 2-23)

Extra agricultural economic activities show many of the same features of the areas to both the north and south. Among the cash-grain farmers on the upland prairie enclaves there is little employment off the farm. Such is not the case in the rougher sections. In these areas agriculture is often marginal. There is an acute need among the farmers for extra employment. Indeed, in many of the rough sections the farming is so marginal and the level of skill of the farmers so low that a significant rural slum has developed. Farm abandonment

has often been widespread. (Fig. 4-14) These families would be difficult to classify. They gain their livelihood in part as unskilled or semiskilled laborers, but they usually farm small acreages. (Fig. 4-15) Their total income is inadequate to raise their socio-economic level any higher than what might be called rural slum dwellers. Most of these people find seasonal employment as laborers for other farmers, laborers in construction, or semiskilled labor in such businesses as shoe factories, saw mills and the like.

SUMMARY AND CONCLUSIONS

Coles and Cumberland county constitute an area which is almost equally divided into thirds by agricultural areas, all quite different in appearance. The northern third of the study area represents the southern margin of the Wisconsin stage of continental glaciation which is the most recent stage of the Pleistocene glacial epoch. This area has been developed into a prosperous agricultural region of national and world renoun in which cash-grain production has come to be a specialty and the predominant land use.

The southern third of the study area lies on the surface of the Illinoisian drift sheet which was the stage of glaciation which preceeded the Wisconsin by several thousand years. The surface of the Illinoisian drift sheet has been exposed longer and has, therefore, been more thoroughly dissected by the various agents of erosion. In addition there has developed a distinctive subsurface layer of extremely slowly pervious clay minerals and salt. This layer has given rise to a soil type which characterizes the vast southern Illinois area and is the source of its many names the most popular of which is the Claypan farming region. The Claypan region covers about one-seventh of the state. The region has for many years been equally as famous as its northern counterpart but not in terms of prosperity. It is almost universally accepted that

the Claypan region has been unable to support a prosperous farm population.

These two extensive drift sheets are separated physically by the Shelbyville moraine. The morainal area is in terms of age and structure merely an extension of the Wisconsin drift sheet. The most significant justification for its separation into a specific unit of area for this study is the fact that its surface configuration and the agricultural practices within the area are accepted as the distinct boundary which divides the cash-grain region from the claypan region.

The purpose of this study has been to critically analyze the patterns of agricultural production across the traditional morainal boundary in order to discover the nature and degree of impact of the moraine on agricultural land use.

The investigation was based primarily on two sources of information. First, the data which were used as a source of information for the construction of the maps which appear throughout the study were taken from two sources. The accessors reports of the Illinois Cooperative Crop Reporting Service were used for the construction of the isopleth maps. The data which were derived from a questionnaire circulated among random samples of farmers from each township in the two counties were used in interpreting the generalized maps. Second, but by no means less important, was a program of interviews and field work. In addition ground and aerial reconnaisances were completed at different periods of the early growing season.

In light of the evidence growing from this investigation the conclusions which must be reported are contrary to those traditionally accepted. The Shelbyville moraine does not appear to mark the sharp boundary of the cash-grain region. There are three other elementary but closely related factors which give rise to differences in farming practices in the Claypan and the Cash-Grain areas as they occur across the Shelbyville moraine.

First, it must be recognized that a far greater percentage of the available land in the clay pan section of the study area is in slope too steep for cultivation. The Illinoisian drift sheet has been exposed to the agents of erosion for several thousand years longer than the Wisconsin sheet to the north and as a result is more maturely dissected. Agricultural operations in these hilly borderland areas are marginal. To add to the difficulty of the broken surface is the fact that level upland prairies and the erosional stream bottoms are irregular in shape and size. This physical condition does not lend itself to extensive specialization in the cash-grain crops. On the other hand, the Wisconsin drift surface is very youthful, unbroken by stream erosion, and for the most part lacking in an extensive forest vegetation cover. It is possible and very practical to organize large parcels of land under the management of one farmer. Such large parcels lead to the possibility of developing large agricultural economies of scale where cash-grain specialization is possible and very profitable. One of the key differences between the Cash-Grain region and the Claypan region lies in the physical

limit of land which may be brought under efficient cultivation. The criteria is in the amount of land in slope. There are areas within the cash-grain region which have been dissected by stream erosion. In these hilly borderlands farming practices are identical to those found in the rougher sections of the moraine as well as in the hilly sections of the claypan area. The rough sections of the Shelbyville moraine are part of a large number of such areas within the study area.

Secondly, there is the matter of soils. There are a number of characteristics by which soils of the Illinoisian drift sheet and the Wisconsin differ chemically. But two of the major differences are the water retention properties associated with the amount of organic matter in the soil, and their capacity to be cropped continuously in cash-grain crops.

The claypan soils have very little organic material since they developed primarily under a forest vegetation and were later veneered by a blanket of loess, from which there developed a distinctive subsurface layer of clay minerals and salts. In periods of alternating wet and dry weather the organic materials in the soil have been almost completely deteriorated; thus, in extended dry periods these claypan soils do not supply sufficient moisture to sustain cash-grain crops. Furthermore, it has been demonstrated that the claypan soils are not capable of producing a cash-grain crop year after year. Continuous cropping in the cash-grains lead to continuous depletion of the soil and consequent annual reductions in yield.

Soils on the Wisconsin drift sheet developed under a climate favorable for grass cover. The decaying root and stem systems of the grasses resulted in a high organic matter and lime content. Although the Wisconsin drift sheet was covered to some extent by loess the veneer was not deep. Furthermore, there has been no subsurface layer of claypan developed. The dark prairie soils are more quickly permeable than the claypan soils to the south but the organic content of the soil retains water for much longer periods of time. Since the dark prairie soils do not have the distinct subsurface layer they are not subject to such long alternating periods of saturation and dessication. The result is that the organic matter has not deteriorated and the free lime which characterizes the dark soils has not been leached away. Consequently, the dark prairie soils are capable of sustaining continuous cropping in the cash grains for much longer periods of time than the clay-pan soils without the threat of serious soil depletion.

In any one year, providing there is adequate rainfall, the claypan soils will produce almost the same yield per acre as the black prairied soils to the north. There is by no means enough descrepency between yields of any of the cash-grain crops to justify the vast difference in price between acreages in the two regions.

Finally, there is the manner in which the land is operated. Most of the farmers in the Claypan areas are owner-operators and their farms are consistently smaller than those to the

north. There are some landlord-tenant relations but these are not the general pattern. The farmers of the Claypan area concentrate their efforts primarily on cash-grain production but as mentioned above they are limited by the actual amount of land suitable for cash-grain production and the careful management practices which are so crucial in the success of their farming operation. As a part of their management practices claypan farmers find it profitable to extend their operations to include raising and feeding livestock.

In the prairie areas to the north the practice of absentee landlords of renting their property to tenant farmers for cash-grain specialization dominates the agricultural enterprise. In this area farming has more nearly reached the proportions of specialized manufacturing activity. The process of extensive agricultural mechanization has reduced the number of people in farming and has led to an acute demand for land. Agriculture on the prairie of the Wisconsin drift sheet has taken the form of an industrial enterprise in which the ownership responsibility has been separated from the landlord by the management and productive ability of the tenant. Specialization and growth are the central activities and motives of the farmer-managers of the area.

The significant factors which give character to the agricultural landscape on both sides are the moraine are directly associated with the amount of land in slope and timber; the nature of the soils; and the traditional management practices. Continental glaciation has indeed effected these factors to a significant degree. However, emphasis cannot be placed upon the Shelbyville moraine when

analyzing the differences between the claypan and the cash-grain regions. The fact that the rough belt of topography occupies a position in the transition area between the two major agricultural regions is coincidental. The moraine does not, at least at the present, cause the differences.

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APPENDIX A

LAND USE QUESTIONNAIRE

Please do not sign your name to this questionnaire. If you feel uneasy about answering any part of it, please do not. However, let me remind you again that omissions will cause the data to be imcomplete and invalid.

1. Location
   - A. County_____
   - B. Township_____
   - C. Section_____

2. Nature of Your Agricultural Enterprise
   - A. How many acres are there in your farm? ( )
   - B. How many acres do you ordinarily have in each of the following crops?
     1. Corn_____
     2. Soy Beans_____
     3. Wheat_____
     4. Oats_____
     5. Hay and/or permanent pasture_____
     6. Orchards_____ What Kind (s)_____
     7. Timber and/or wood lots_____
   - C. Livestock (How many head of each of the following do you feed?)
     1. Beef Cattle_____
     2. Hogs_____
     3. Sheep_____
     4. Other_____
   - D. Dairy Cattle_____
   - E. Poultry
     1. Layers_____
     2. Broilers_____
     3. Ducks and/or geese_____
     4. Turkey_____
     5. Other_____ Please name_____
   - F. What is a typical crop rotation on your farm? 1st year_____, 2nd year_____, 3rd year_____, 4th year_____, More_____(please name)
   - G. Which fertilizers are most needed on your farm to maintain most efficient productive potentials?
     1._____
     2._____
     3._____

H. What seems to be the greatest physical problem you have with your land? (By physical problems I mean such things as too much slope, hard subsurface layers, too sandy, poor drainage, etc.) (Please list in order of importance)
1._____
2._____
3._____

I. Off hand, what would you say your land is worth per acre? $_____

J. About how much of each of the following crops will your land produce per acre?
1. Corn_____bu.
2. Soy Beans_____bu.
3. Wheat_____bu.
4. Hay_____tons

K. Are you engaged in any sort of occupation other than farming?
(Yes) (No) If so, what?_____

3. Land Tenure

A. Do you (own) or (rent) your land, or (both)? Please underline the proper answer.
1. If you own your land, did you (purchase) or (inherit) it?
2. How long has your land been in your family?_____

B. If you rent your land, how long have you rented it?_____years
1. On what terms do you rent? (shares) (cash)
2. Where does the owner of your property live? City_____ State_____

C. If you own and rent land, how much do you own? (_____acres) and how much do you rent? (acres)

D. Is your land in (one tract) or in (several tracts)?

Note: It is very important to get the return on this questionnaire as soon as possible since the study cannot advance until all of the information is in. It is necessary to have all returns no later than April 10. Please enclose the material in the self-addressed envelope and drop it in the mail. The postage is paid.

Thank you for your cooperation.

Troyt B. York

Dear Farmer:

As you probably well know the masters degree from any university requires that a student do a piece of substantial research and submit a thesis to be examined by a board of university professors.

It is quite difficult to obtain statistical data for very small areas from the various state and federal agencies so it becomes necessary for the student to do his own field work, interviewing, and surveying in order to get usable data for formulating realistic conclusions. That is the purpose of this questionnaire.

The information that you provide will be used in a paper which will deal with the nature of the agricultural enterprise in the Cash Grain Area of northern Illinois and the General Farming Area of southern Illinois.

You should understand and be confident that the information you provide will be held in strict confidence. The paper will not be published or the information in any other way disclosed to any person save myself, my thesis director, Dr. D. A. Price of the E. I. U. geography department, and my university examining board. If there is any aspect of the questionnaire that you feel you would rather not answer, please do not. However, let me say that omissions will cause the data to be incomplete.

Your cooperation on this project will determine its success or failure.

Very Sincerely Yours,

Troyt B. York

APPENDIX B

SUMMARY OF SURVEY RESULTS

LAND USE

(All figures are in terms of the number of acres per farm in a particular land use.)

Twp. & Ave. Size Farm		Corn	%	Soybeans	%	Wheat	%	Oats	%	Hay	%	Pasture	%	All Other	%
Mttn	370	120	32	101	27	40	10	28	7	15	4	33	8	33	8
Humbt	319	129	40	91	28	33	10	18	5	24	7	15	4	9	6
7 Hick	307	129	42	86	28	31	10	20	6	21	6	20	6	--	0
N. Okaw	296	98	33	81	27	30	10	20	6	16	5	23	7	28	9
Laft	287	91	31	73	25	27	9	17	5	18	6	27	9	34	11
Asmr.	285	95	33	66	23	28	9	18	6	16	5	47	16	15	5
Huttn.	275	71	25	46	16	24	8	20	7	25	9	52	18	27	9
Mrgn.	272	91	33	66	24	31	11	14	5	11	4	30	11	29	10
Pads.	265	98	36	69	26	23	8	17	6	15	5	19	7	24	9
E. Oak.	243	87	35	55	22	25	10	14	5	14	5	32	13	16	6
Pl. Grv.	239	74	30	51	21	23	9	21	8	16	6	24	10	30	12
Chtn.	211	59	27	44	20	24	11	15	7	15	7	42	19	12	5
Ctnwd.	188	56	29	46	24	22	11	8	4	20	10	19	10	17	9
Cr. Crk.	218	55	25	65	29	27	12	9	4	15	6	24	11	23	10
Grnp.	208	62	29	54	25	26	12	15	6	13	6	23	11	17	8
Neoga	267	76	28	65	24	27	10	13	4	19	7	32	11	35	13
Spg. Pt.	176	54	30	39	22	19	10	7	3	14	7	24	13	19	10
Smtr.	239	55	23	51	21	25	10	7	2	17	7	47	19	37	15
Union	280	58	20	64	22	28	10	13	4	17	6	47	17	57	18
Wdbry.	283	82	28	49	17	28	9	18	6	17	9	33	11	64	22

SUMMARY OF SURVEY RESULTS (Cont.)

LIVESTOCK

(All figures are in terms of the number of head of livestock per farm (Average).)

Twp.	Beef	Hogs	Dairy	Sheep	Total
Mttn.	40	5	2	25	72
Hmbt.	5	5	2	--	12
7 Hick.	3	15	1	--	19
N. Okaw.	13	7	8	6	34
Laft.	15	6	9	19	39
Asmr.	11	5	3	19	38
Httn.	11	8	8	--	27
Mrgn.	11	10	2	9	32
Pads.	10	11	2	18	41
E. Oak.	10	11	4	--	25
Pl. Grv.	13	8	3	19	43
Chtn.	19	7	4	--	20
Ctnwd.	16	7	2	13	38
Cr. Crk.	5	5	3	9	22
Grnp.	10	7	4	14	35
Neoga	25	9	2	19	55
Spng. Pt.	23	7	10	21	61
Sumpter	5	4	6	--	15
Union	9	6	2	16	33
Wdbry.	12	7	2	26	47